THE CANADIAN ISTAR INFORMATION-CENTRIC COLLABORATIVE WORKSPACE CONCEPT

PAPER ONE
The Info-Centric Collaborative Workspace from an Organizational Perspective

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Abstract

1. Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR) is an evolving information operations (IO) concept in the Canadian Land Force. ISTAR provides the commander with a system to collect and process required information for producing intelligence on the threat and knowledge on the environment during operations, as well as knowledge needed to identify, acquire and engage targets. The various processes used to collect and analyze the information are the result of numerous individual systems some of which have only been recently introduced in the field while many others are still in development as a result of advances in the information age. This compendium of systems makes ISTAR a "System of systems", as opposed to a single system. These four papers present the new Canadian information centric collaborative workspace concept that provides a more coherent information management approach to better support the Commander in both its tactical intelligence and operations activities at brigade level. The info-centric collaborative workspace concept aims at offering a seamless collaborative environment enabling the ISTAR staff to perform their tasks using different applications / services through a standardized Human Computer Interface (HCI).

Introduction

2. The explosion of information technologies has set in motion a virtual tidal wave of change that is in the process of profoundly affecting both organizations and individuals in different aspects. This means that military organizations also face a tidal wave of transformation of an irresistible force that, at the same time, offers unprecedented challenges. The military does not have much choice. Resisting transformation is futile. However, accepting transformation in only the technological aspect is also not a valid option. Today, improvements in processing power and communications means make information technologies even more attractive and cost-effective for organizations to implement. Willingly or not, we have entered the information age. As Owens puts it, for a long time, information has been inseparable from commanders, command structures, and command systems [Owens 95]. Information is no longer the prerogative of commanders and command structures but has become necessary to all participants in a mission.

3. Many armies have by now learned that when introducing Command and Control (C2) information technologies (IT) to their organization, a series of changes occur in a number of areas and if these changes are not properly taken into consideration in the planning stages of the

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transformation process, then these changes will become hindrance in the accomplishment of the missions thus planting the seeds for the overall rejection of the system. The areas that will be affected and need to be considered in the transition have been regrouped into three main perspectives as illustrated in Figure 1 and are: a) Systems, b) Users, and c) Processes. What is meant by "systems" are the hardware and software components related to Information Technologies (IT) that, when put together according to a set of requirements and specifications, make up IT systems. The term "users" refers to the people and their skills, education, training, experience and Organizations. The term "processes" refers to the Doctrine, Standard Operating Procedures (SOP), and Techniques, Tactics and Procedures (TTP). The successful business solution will be the one achieving best harmony between the three perspectives: Users - Processes - Systems. In this series of papers, the authors will be presenting one by one, each apex of this harmony triangle and the achieved business solution. The first paper covers the Canadian military organization and the transformation needed to exploit the new emerging Command Support environment from an information centric collaborative environment perspective. The second paper presents the ISTAR context and its inherent imbedded processes while introducing the adaptation needed for an organization to become more effective as an information driven organization. The third paper covers the System of systems Service Architecture perspective and describes the approach taken to develop an information centric collaborative workspace solution. The fourth paper brings forward an approach and some techniques to implement the three previous perspectives and keep a global system harmony. It also includes some of the lessons learned in developing and implementing the Canadian Command Support Info-Centric Collaborative Workspace (ICCW) using a value management approach.

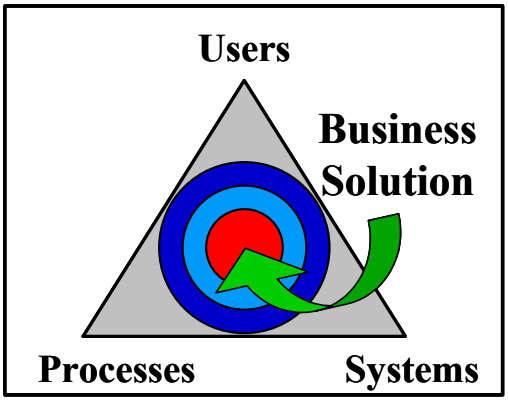

Figure 1: System of Systems Harmony Triangle:
Users - Processes - Systems

The New Canadian Land Force Employment Concept And The ISTAR Context

4. In order to be able to face the continued changing face of the security environment, the Canadian Army had to develop a new concept as to how it will fight to guarantee success in operations. This new Land Force Employment Concept is based on five operational functions, which are: *Command, Sense, Act, Shield,* and *Sustain* [FE 2004]. This paper is going to concentrate more on the first two operational functions because they more are directly related to the context of ISTAR. The first operational function is directly linked to commanders and their staff. *Command* is the creative expression of human will necessary to accomplish a mission through the exercise of the authority vested by the national government and the chain of command for the direction, coordination and control of military forces. Personnel, facilities and processes support the exercise of command. This grouping is known collectively as the

Command Support System, a system that is eclipsing the previous commander and staff relationship. *Sense* is the inextricable companion of *Command* and provides the commander with knowledge. The *Sense* operational function ensures that relevant data from all sources is collected and analyzed in order to enable mission success. The understanding a commander has of the situation is directly related to the ability to collect the relevant information and have it presented in a manner that is both timely and suitable.

5. In this new concept of Land Force Employment, the traditional division into staff and signals is being blurred through the effects of digitization. Hence, digitization is the application of information technology for the acquisition, processing and distribution of digital information to enhance situational awareness and operational effectiveness. The advent of digitization changed the way decision-making had always been done in the past. The dilemma of commanders is now largely a problem of data collection, storage, retrieval, manipulation and comparison. In short, it is a problem of information management if the commander does not want to be overwhelmed with information. On the other hand, he is faced with the problem of shortening the life-cycle of the decision-making process without increasing the failure rate of the decisions being made [Curts 2001]. Traditionally, the staff was responsible for the production of orders, and signals were responsible for the means of distribution. Information technology is now the key tool in the planning of orders and the control of execution. This means that the ISTAR (Intelligence, Surveillance, Target Acquisition, and Reconnaissance) function has become a part of both the *Command* and *Sense* operational functions. In the Canadian Land Force Information Operations doctrine [IO 1999], the definition of ISTAR is: "a system where information being collected through systematic observation and sensing is integrated with that collected from specific missions, and is processed in order to meet the commander's information requirements." ISTAR integrates sensor capabilities and the intelligence process that provides the direction and processing of sensor data. Therefore, the ISTAR constitutes a "System of systems" that is managing and fusing data to serve the *Command* function through integration of a wide range of sensing capabilities and information functions and processes.

6. As with any other information system, the ISTAR System of systems encompasses the three main perspectives: the systems, the users and the processes by which these users use the systems. Experience shows that the introduction of new information technologies and their capabilities into organizations is potentially risky unless accompanied by a planned change transition in a number of key areas. Within the operational context, it is assumed that ISTAR produces intelligence in response to commander's information requirements. These information requirements provide direction on the employment of the ISTAR system and provide the framework within which ISTAR information and intelligence products are exploited.

7. The conditions for transformation in the "systems" perspective imply that to fully exploit the new capabilities offered by information age technologies, the ISTAR TD team has learned that military organizations like armies should consider at least five things: a) develop an information business vision, b) develop a top-down "System of systems" architecture supporting the vision, c) adopt a data-centric vision with a common reference model, d) field a distributed network-centric capability and e) embark on an information-centric collaborative workspace environment approach [Thibault 03]. The Canadian Land Forces (CLF) have adopted a new business vision through its Force Employment Concept. They are actively pursuing a top-down "System of systems" architecture to support an Information-Centric Collaborative Workspace (ICCW) environment with the ISTAR Technology Demonstration program while in the meantime adopting a data-centric approach. These changes began to be felt a few years ago and the fielding of these new capabilities will begin in 2006 and reach fruition around 2012.

The Ingredients for "Organizational" Transformation

8. Humans and organizations in which they work are integral to the Command and Control System (C2S) that is supported by the Info-Centric Collaborative Workspace. After all, it is human beings, not technology, that have to lead and make the essential decisions on the battlefield that determine life or death for subordinates and the enemy, and ultimately mission failure or success.

9. The Info-Centric Collaborative Workspace provides a mechanism through which a decentralized execution of operations is possible based on the sharing of available information and common intent, and allows lower levels of command to exercise initiative. A C2S supported by an Info-Centric Collaborative Workspace aims to reduce uncertainty and add efficiencies by gathering and disseminating relevant information and providing an environment conducive to collaboration. It is also incumbent on the C2S to provide accurate, timely and relevant information that contributes to the knowledge and understanding of commanders.

10. Historically, it would be inappropriate to state that there is not currently some kind of supporting environment that lends itself to enhanced collaborative work. This environment is also recognized and described in some form or another in present or proposed doctrine publications. In fact, cooperation and coordination have been part of command doctrine for a long time. No army unit or formation could perform effectively in battle without having collaborated with those units/formations it must work with. The C2S is not a closed loop and demands that superiors and subordinates cooperate and work together toward a common purpose. Similarly staff cells have to cooperate and coordinate so they can provide coherent advice to the commander.

11. Nevertheless, there is a realization that traditional command doctrine does not optimize the enhanced collaboration possible brought about by such capabilities as the Info-Centric Collaborative Workspace. Additionally, the command philosophy does not stress collaboration enough. The staff and HQ structures are not aligned with the fundamental battle processes, the operational functions or the information needs of the commander. Finally, doctrine does not capitalize on the significant potential benefit that could be expected from components of digitization such as the Info-Centric Collaborative Workspace.

Operational Environment for the Army

12. In order to understand the impact of an the Info-Centric Collaborative Workspace on the staff and HQ structure of the Army, it is important to understand the environment in which it is anticipated to have to operate. The premise is based on a three-block war concept employing medium weight forces deployed over complex terrain against an asymmetric threat with an unsympathetic population.

13. The following major characteristics of this environment include:

a) An asymmetric nature of the threat;
b) Enlarged areas of operations;
c) Non-contiguous and non-linear operations;
d) The concept of the "Three-block war";
e) Use of complex terrain; and
f) Effects-based warfare within a manoeuvrist approach.

14. These characteristics will present a severe problem [Baliga 1985] for the commander and will demand from him and his staff dramatically increased efficiency, effectiveness and speed.

Current Situation

15. The design of an efficient staff and HQ structure able to achieve the Commander's objectives effectively requires an understanding of what an organization is and how it functions. At its simplest, an organization is two or more people working together in a coordinated manner so as to achieve group results. An organization should have a clear role. In addition, all organizations have a human aspect; they therefore require some degree of discipline within a defined structure.

16. There are five organizing fundamentals which apply to command:

a) **Unity of Command.** A commander should be accountable to only one superior. This ensures clarity and unity of effort, promotes timely and effective decision-making, and avoids conflict in orders and instructions. Unity of command is effected through a clear chain of command, whereby command at each level is focused on one commander. This fundamental applies at all levels and in joint operations. In combined operations and operations other than war, however, absolute unity of command may not be achievable.

b) **Cooperation.** A Principle of War, cooperation complements unity of command. It entails the coordination of individual and group activities to achieve an optimum combined effect for the common good. The basis of cooperation is teamwork, trust and mutual understanding, based upon a common understanding of the commander's intent and developed through training. Three further elements contribute to cooperation: a common aim (reflecting unity of effort), mutual goodwill, and a clear division of responsibilities. Mutually agreed doctrine and clearly defined command relationships formalize military cooperation.

c) **Balanced Structure**. There is a limit to the number of subordinates a superior can command effectively. The optimum number will depend primarily on the complexity and tasks of the particular organization. A balanced and capable overall structure is achieved by adjustment of the span of command—the 'width' of an organization or number of direct subordinates of a commander.

d) **Responsive Procedures**. Procedures must be simple, efficient and flexible in order to be responsive, and so assist the development and maintenance of tempo within a command. Standard Operating Procedures save time and effort.

e) **Dynamic Organization**. The organization for command must be dynamic. Changed situations and new technology will demand adjustment of structures, doctrine and procedures. For example, the structure of a force and its HQ deployed on peace support operations may differ considerably from that for regional conflict or general war. Therefore, a responsive and continuous monitoring and review mechanism is required in the organization for command.

17. Today, the Canadian Army staff structure is based on a hybrid of the continental staff system that is encountered in many European nations. There is no formal distinction—either by dress, qualifications or title—between members of the staff and those serving on regimental duty, or between members of the staff and those of a more "general staff". The current structure of the general staff is broken down as G1 (Personnel - Administration), G2 (Intelligence), G3 (Operations), G4 (Logistics), G5 (Plans and Policy), G6 (Communications and Information Systems), G7 (Doctrine and Training), G8 (Resources and Finance) and G9 (Civil-Military Cooperation) as shown in Figure 1.

18. This staff and HQ structure assists the commander in meeting responsibilities for overall command. The general staff is concerned with planning, coordinating and supervising the execution of operations and training. It also arranges the support arm, support services and liaison required to accomplish the mission [B-GL 1996].

19. The current staff and HQ structure, while working at assisting the commander in his responsibilities, is compartmentalized with very specific responsibilities and tasks and the production of very specific command and control products. Today, in order to accomplish their tasks, they use a variety of tools and techniques. They range from paper maps and grease pencils to elaborate electronic spreadsheets and databases. Moreover, the nature of these tools has evolved tremendously over the years and has become more and more specialized. However, they have been developed as stove-pipe systems successful in providing automated support in a very discrete and specialized manner. This has resulted in further specializing the staff structure to the point where individual branches of the "general" staff have overspecialized themselves in the execution of specific activities within the Operational Planning Process (OPP), the Battle Procedure (BP) and the Intelligence Preparation of the Battlefield (IPB). This overspecialization has come to the detriment of increased collaboration to the accomplishment of the common goal.

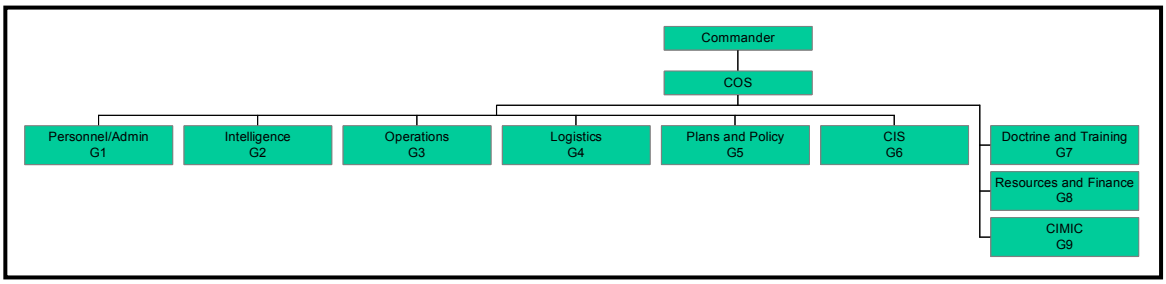

Figure 1: Canadian Army General Staff Structure [B-GL 2003]

Organizations and the ICCW

20. The Info-Centric Collaborative Workspace (ICCW) provides a new dimension to the collaborative work and sharing of information within the general staff. When provided with such technologies, staff and HQ structures should be modeled in a way as to foster more balanced levels of participation among team members. Significant research has been done to determine the optimum organizational structure [Price 2001] for given circumstances between divisional and functional structures. In a divisional structure, work units within an organization are constructed so that each unit possesses the skills and/or resources required to complete a product the organization produces. In contrast, a functional structure produces work units that specialize in one aspect of a product's production. The different specialized units coordinate to produce a finished product. More genuine to the current military environment, when the tasks to be performed are unpredictable and uncertain, a divisional structure works better that a functional organizational structure. On the other hand, when the situation is relatively predictable and certain, then a functional structure with specific specializations to meet specific needs/threats is more efficient.

21. Despite the fact the operational environment described above is complex and that some of its characteristics are uncertain e.g., the nature of the threat, the very nature of the work performed by the military organizations is still stable and predictable. In such circumstances, an ICCW environment will allow a functional organization to perform its activities in a more accurate and efficient way.

Staff and HQ Structure

22. Some of the key principles that apply directly to the staffing and structure of HQs are unity of effort, pursuit of a common goal and trust between members of the team. The proposed staff and HQ structure should:

a) Emphasize knowledge management;
b) Have reduced reliance on traditional functional staff (G1 to G9 structure) by having teams organized around operational functions and products or services;
c) Be based on strict rules for collaboration and information sharing;
d) Foster personal accountability;
e) Be disciplined; and
f) Be capable of shared tasks while distributed across space, time or organizational boundaries.

23. As much as possible, to reach its full potential, brigade HQ, and to the extent possible unit HQ, must be staffed and structured similarly both in garrison and in the field. The core staffs that are required for deployment must be the same core staffs that work together daily in garrison.

24. The staff and HQ structure must be designed around the five operational functions: *Command, Sense, Act, Shield* and *Sustain*. This will be possible with the establishment of five main HQ cells; Command, Current, Sense, Effects and Plans. The following provides a brief description of the staffing and purpose of each of these cells [FE 2004].

a) **Command.** This cell contains the Commander and the Chief of Staff and their personal staff to include the HQ Chief Knowledge Manager. The Chief Knowledge Manager is responsible to the COS for the internal coordination of all information arriving in and going out of the HQ to include following up on key events and issues. From time to time the command cell may include advisers or specialists that are available to the Commander for all or parts of an operation.
b) C**urrent**. The current cell runs the current battle on behalf of the Commander. It contains the necessary coordinating staff to manage the battle as well as to undertake any short term planning that may be required. This includes a Sustain function with respect to ongoing operations and any branch plans that may spawn as events unfold.
c) **Sense.** This cell coordinates all of the Sense assets available to the Commander. The cell staff is responsible for the tasking of the Sense assets in accordance with the Commanders' priorities, with conducting analysis on the information received from those assets and then expeditiously distributing the product from that analysis to those within and outside of the HQ who can best use or act on the product.
d) **Effects.** This cell coordinates the Act and Shield assets. They are the agents for the delivery of capabilities and effects as directed by the Commander using the targeting process and priorities as their primary means.
e) **Plans.** The plans cell conducts long term planning on behalf of the Commander. A core team of general staff officers from all operational functions mans the cell with advice being sought for planning events collaboratively from other cells, other HQ and other agencies often through a reach back process.
f) There is a need for two additional cells to provide integral support to the HQ. These are the **communications and information systems** (CCIS) control cell and the **administrative support** cell. In addition to its normal support, the administrative cell is responsible for the proper archiving of all digital and other

information received in or dispatched from the HQ. The CCIS control cell monitors and troubleshoots all of the HQ CCIS.

25. A key person in each of these cells less the Command cell is the cell Knowledge Manager. Not only are these individuals responsible for the monitoring and follow up on all incoming knowledge, they are also responsible for the quality of the knowledge that is distributed from the cell. Functional input (as in G1, G2, etc) is assured by having staff with functional expertise as required in the Current, Sense, Effects and Plans cells where they are employed as general staff. As a result, traditional continental staff branch cells have no place in this HQ. Functional planning and execution are conducted remote from the HQ either by the functional units themselves or cells established within those units. Much of the functional planning may also be done through reach back CW with higher HQ and/or agencies. What is required is functional input, not functional cells or processes in the HQ to manage it.

A New HQ Structure

26. An environment that will maximize the benefits of an Info-Centric Collaborative Workspace will include Command, Current, Sense and Effects cells. The Plans cell is separate from but close at hand to the other four cells. This allows for reinforcement of the Plans cell with expertise from the others during critical stages of the commander's battle process. See figure 2 below. This new HQ structure will call upon modifications to the current Commander's Battle Process and a new command centric collaborative process is introduced in Paper Two of this series [Thibault 2004].

27. When operationally deployed, the HQ is divided into three main components: the Main, the Tactical Command Post (TAC) and the Forward (Fwd). The Main is structured as noted above while keeping the size to the absolute minimum for reasons of security and mobility. The TAC has limited connectivity and is used by the Commander to move quickly about the battle space. The Fwd has the same connectivity as the Main except it only has sufficient staff capacity to fight the current battle for a limited period of time.

28. The Fwd is deployed in the following circumstances:

a) As a Step-up for the Main;
b) As a forward command post for the Commander;
c) As the Main if the Main is compromised and has to be moved; or
d) Built up as a Main if the Main is destroyed and cannot be reconstituted.

29. The Fwd HQ concept is ideally suited to the three block war scenario upon which the Army is basing its Interim Army experimentation. In this type of scenario it is possible that the Main HQ could be positioned in a permissive area reducing its vulnerability and by extension its need to move. The Fwd with its low profile and mobility could be deployed anywhere the Commander desires for specific events in its area of responsibility (AOR). This while maintaining connectivity so as to allow the collaborative work process to continue seamlessly. Ideally the Main HQ should be as small as possible and housed in a complex that has a plug in and plug out capability to facilitate moves if they are required. T he move away from a rigid adherence to having all of the functional staff in the Main should reduce its size and signature and thus its vulnerability.

Conclusion

30. While research favors a functional organizational structure when the working environment is stable and predictable, the addition to this staff and HQ structure of such

collaborative capabilities as the Info-Centric Collaborative Workspace will enable optimum collaboration and effectiveness of the work towards the attainment of the Commander's objectives. The proposed migration from the traditional G-staff structure depicted in Figure 1 to one that is more aligned to the operational functions i.e., Command, Sense, Act, Shield and Sustain, is brought about by the concept of "horizontal decentralization". This concept shifts the power of the organization away from the current G-staff centralized hierarchical bureaucracy to mid-level "experts" regrouped under the operational functions [McKearney 2001]. The specialization of a functional organization structure along the lines of the operational functions will facilitate tasks performance more than a generalist approach of the divisional organizational structure.

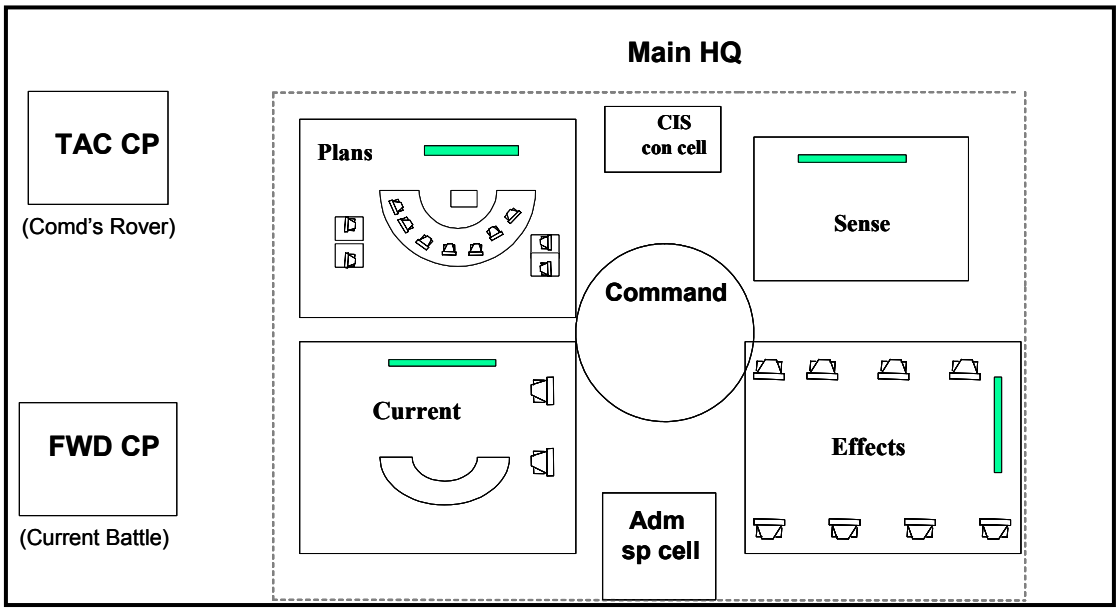

Figure 2: Brigade and Task Force HQ Typical Deployment

REFERENCES

[Baliga 1985] B.R. Baliga, John D. Blair, and James G. Hunt, "A devil's advocate view of the future battlefield", in Leadership on the Future Battlefield, (James G. Hunt and John D. Blair, Eds.) Pergamon Press, Washington, DC, 1985

[B-GL 1996] B-GL-300-003/FP-000, Land Force Command, 21 July 1996

[B-GL 2003] B-GL-331-001/FP-000, Land Force Command Support (Draft 3.0), 28 April 2003

[Curts 2001] Dr Curts, R. J.; Dr Campbell, D. E.; "Avoiding Information Overload Through the Understanding of OODA Loops, A Cognitive Hierarchy and Object-Oriented Analysis and Design"; Published in 6th ICCRTS Proceedings about Collaboration in the Information Age, Quebec City, Canada, 6-21 June 2001

[FE 2004] "How the Canadian Army will FIGHT"; A Force Employment Concept Paper, NDHQ, Ottawa, 18 February 2004, Unclassified

[IO 1999] Information Operations, B-GL-300-005/FP-001, Director Army Doctrine, Kingston, Ontario, 18 Jan 1999, Unclassified

[McKearney 2001] McKearney, T. J.; "Collaborative Planning for Military Operations: Emerging Technologies and Changing Command Organizations", 6th ICCRTS Symposium on Collaboration in the Information Age, 19 – 21 June 2001.

[Owens 95] Owens, William, A., "Introduction to Dominant Battle-Space Knowledge: the Winning Edge"; edited by Stuart E. Johnson and Martin C. Libicki, National Defence University Press, Washington, 1995, Unclassified

[Price 2001] Price, Jana; Miller, Diane, Entin, Elliot and Rubineau, Brian , "Collaborative Planning and Coordinated Team Performance", 6th ICCRTS Symposium on Collaboration in the Information Age, 19 – 21 June 2001.

[Thibault 03] Thibault, G., and LeMay, F.; "Introducing the Canadian Information-Centric Workspace Concept", NATO RTO Military Data and Information Fusion Symposium, Prague, CZ, 20-22 October 2003, Unclassified

[Thibault 2004] Thibault, G., and Le May, F., "The Info-Centric Collaborative Workspace from the Process Perspective", Published in 9th ICCRTS Symposium Proceedings about "The Power of Information Age Concepts and Technologies", September 2004, Copenhagen, DK, Unclassified

Introducing the Canadian ISTAR Information Centric Collaborative Workspace

Paper One: From the Organization Perspective

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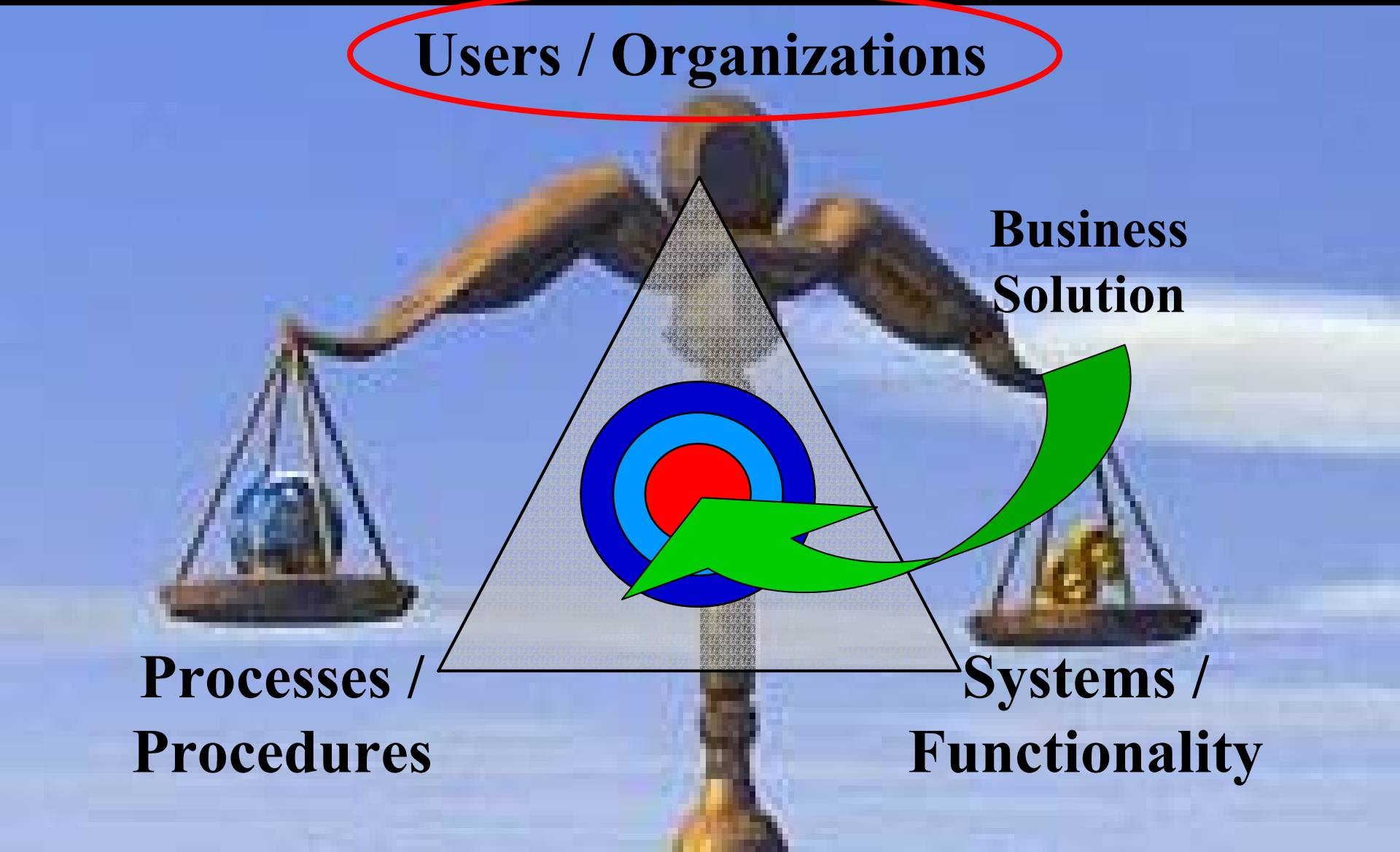
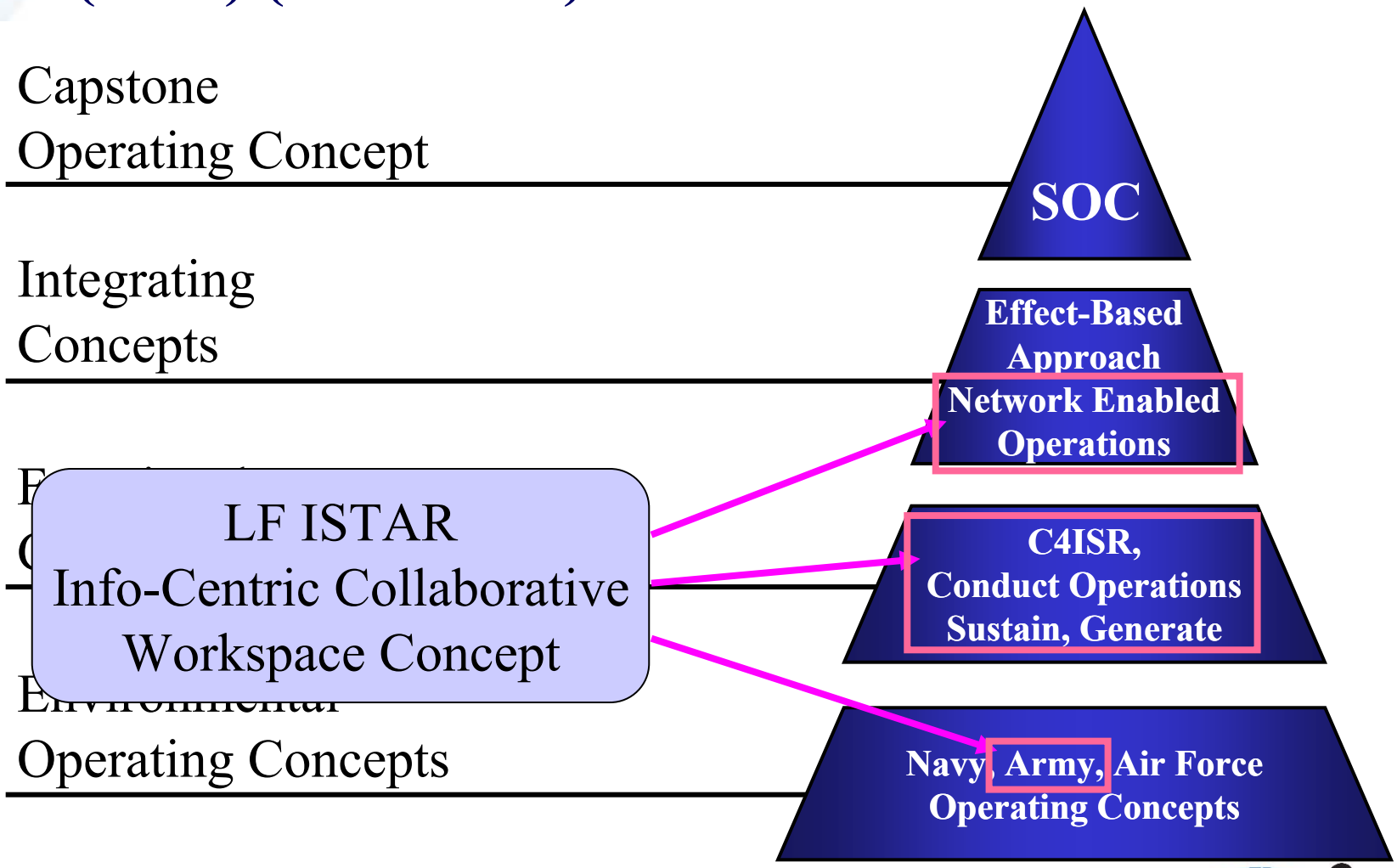
Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR)

- The role of ISTAR is to integrate the intelligence process with the surveillance, target acquisition, and reconnaissance assets in order to improve a Commander's Situational Awareness (SA) and to cue manoeuvre and strike assets.
- ISTAR TD (2001-2005) is a DRDC technology demonstration project that provides risk reduction through advice, proof-of-concepts and technology demonstrators.
- Sponsored by Director Land Command Information (the Land Forces Capability Manager) and ISTAR OMNIBUS project (2004-2012)

PERSPECTIVE AND BALANCE
System of Systems Harmony Triangle



Canadian Forces Strategic Operating Concept (SOC) (DND 2004)

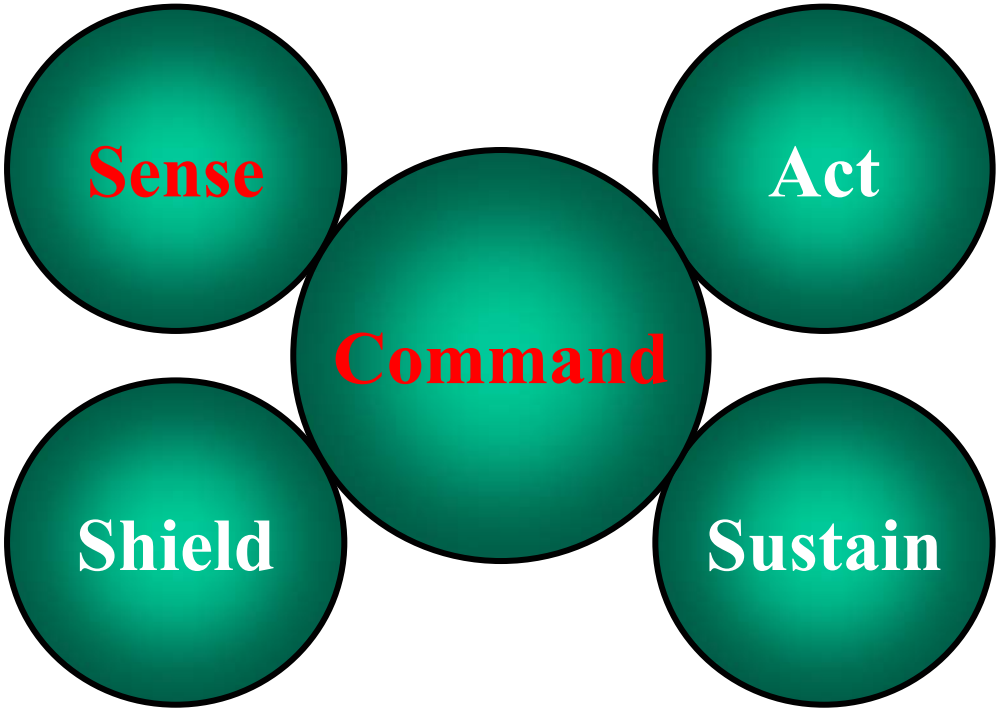


Pertinent Land Forces Operating Concepts

- **LF ISTAR Capability Concept of Operations:** The role of ISTAR is to integrate the intelligence process with the surveillance, target acquisition, and reconnaissance assets in order to improve a Commander's Situational Awareness and to cue manoeuvre and strike assets. (CLF Paper 2002)
- **Collaborative Working Concept:** "The environment in which a military commander makes the best use of available knowledge, experience and intellect from command and staff teams to achieve a common purpose." (CA CW CONOPS 2004)

Functional Concepts

- **Force Employment Concept** revolves around five operational functions: Command, Sense, Act, Shield and Sustain. (CLF Paper 2004)



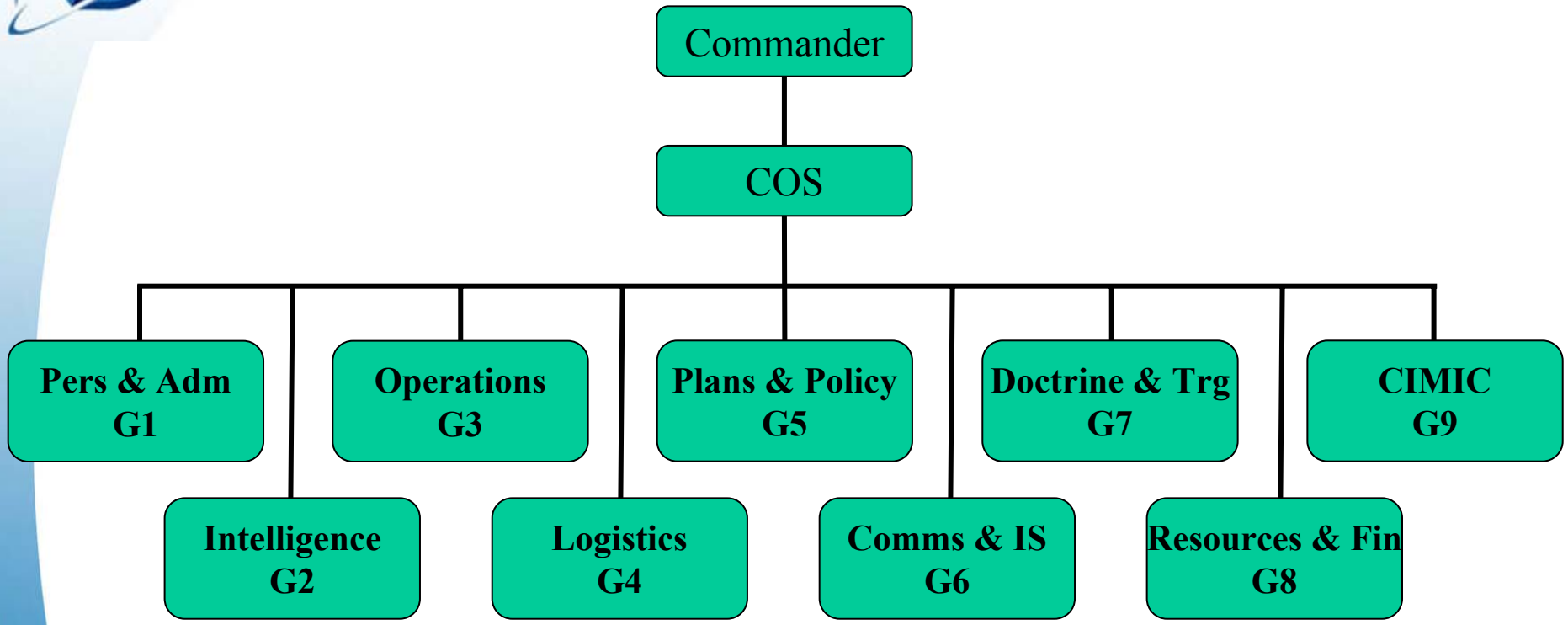
Integrating Concept: Network Enabled Operations (NEOps)

- **Network Centric Warfare (NCW):** An information superiority-enabled concept of operations that generates increased combat power by networking sensors, decision makers and shooters to achieve shared awareness, increased speed of command, higher tempo of operations, greater lethality, increased survivability, and a degree of self-synchronization. (Alberts *et al*, 1999)
  - US-AS: NCW
  - UK: Network Enabled Capabilities (NEC)
  - **CA: Network Enabled Operations (NEOps)**
  - Generally: Network Centric Operations (NCO)

Operational Environment

- The premise is based on a three-block war concept employing medium weight forces deployed over complex terrain against an asymmetric threat with an unsympathetic population.
- The following major characteristics of this environment include:
  - An asymmetric nature of the threat;
  - Enlarged areas of operations;
  - Non-contiguous and non-linear operations;
  - The concept of the “Three-block war”;
  - Use of complex terrain;
  - Increased tempo of operations; and
  - Effects-Based Approach (EBA) within a Network Enabled Operations (NEOps).

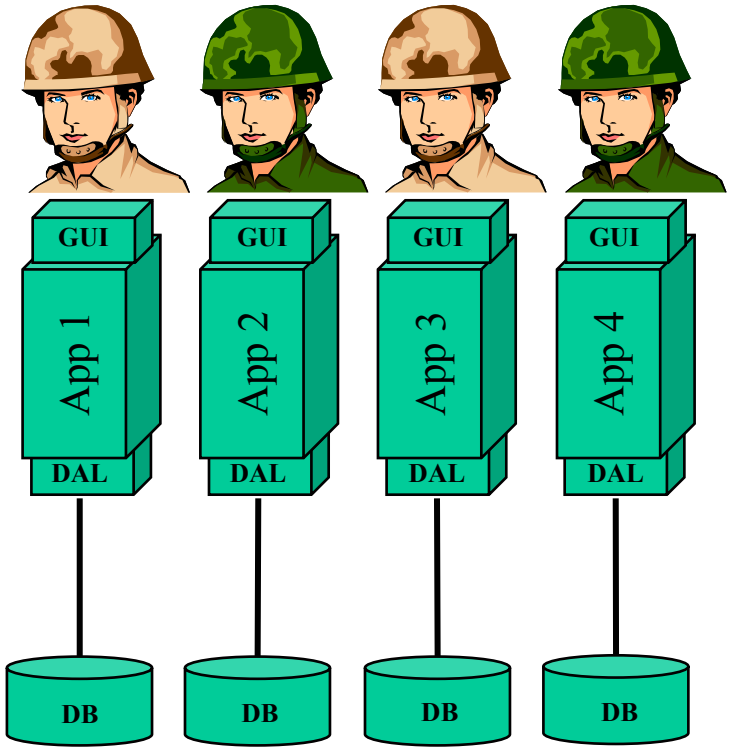
The Continental General Staff System



- G1 (Personnel - Administration)
- G2 (Intelligence)
- G3 (Operations)
- G4 (Logistics)
- G5 (Plans and Policy)
- G6 (Communications and Information Systems)
- G7 (Doctrine and Training)
- G8 (Resources and Finance)
- G9 (Civil-Military Cooperation)

Stovepipe Systems

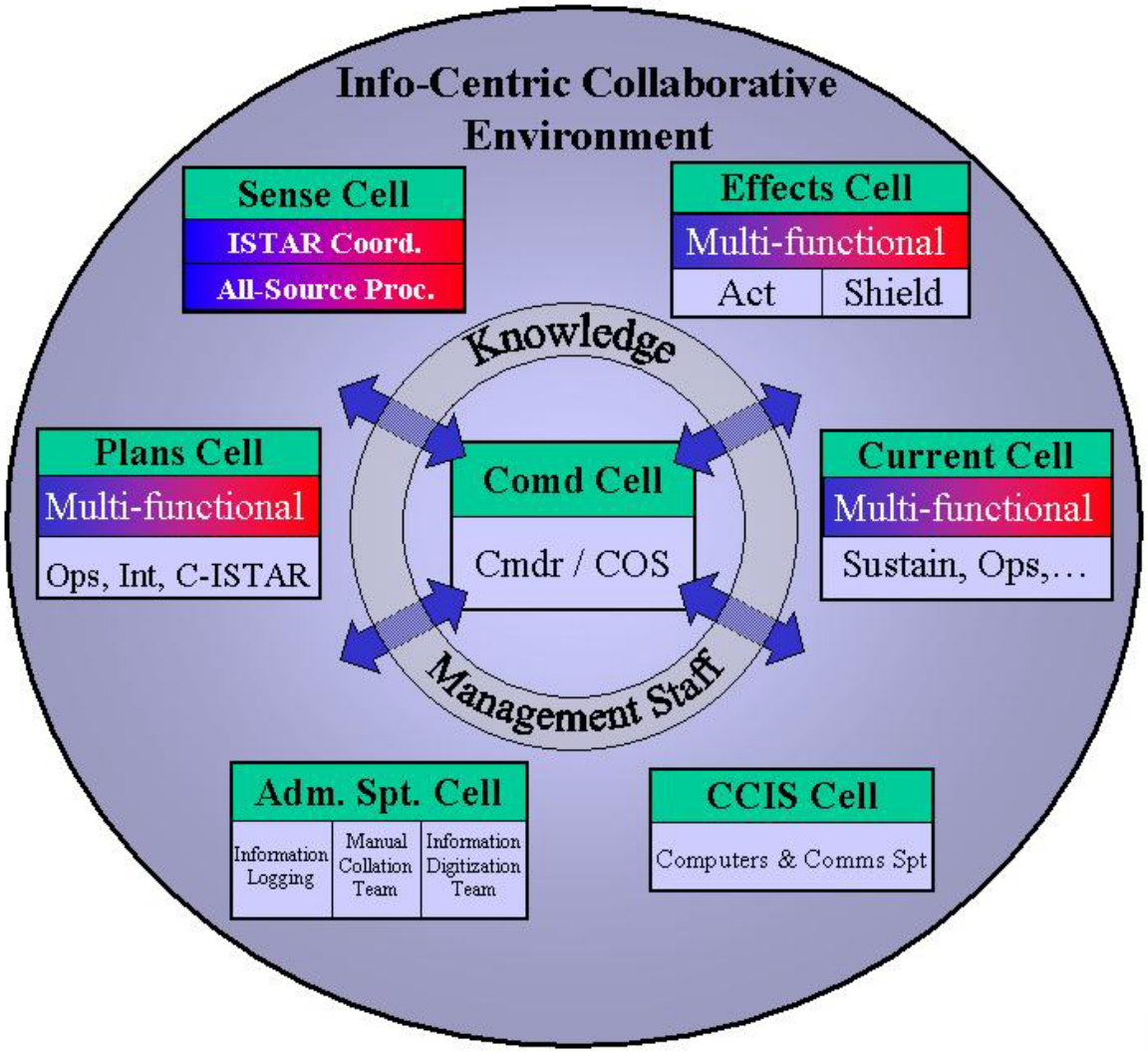
- The “general” staff have overspecialized themselves in the execution of specific activities: Operational Planning Process (OPP), Battle Procedure (BP), Intelligence Preparation of the Battlefield (IPB), etc.
- This overspecialization has come to the detriment of increased collaboration to the accomplishment of the common goal.



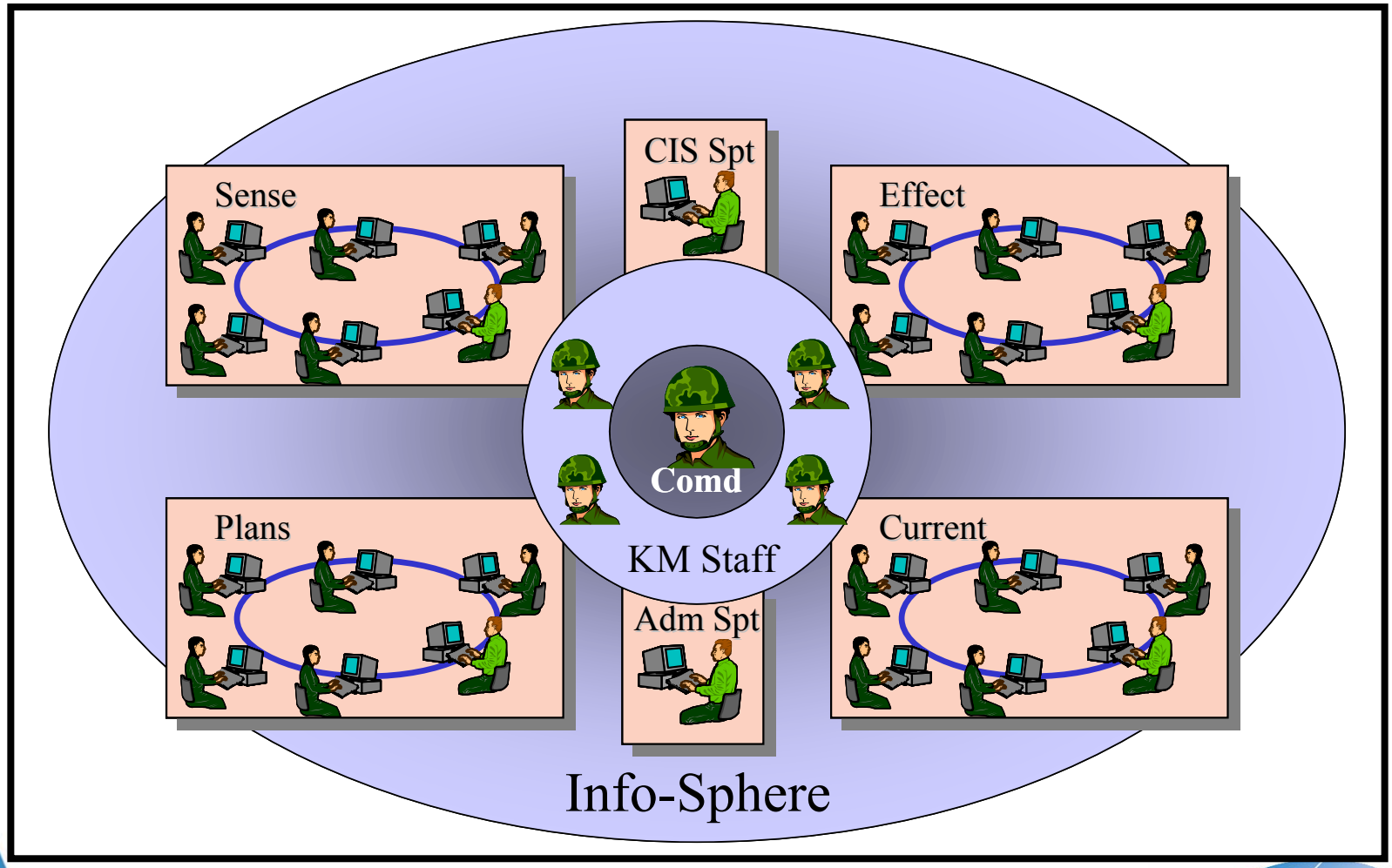
Conditions for Improving HQ Structure

- Emphasize knowledge management;
- Have reduced reliance on traditional functional staff (G1 to G9 structure) by having teams organized around operational functions and products or services;
- Be based on strict rules for collaboration and information sharing;
- Foster personal accountability;
- Be disciplined; and
- Be capable of shared tasks while distributed across space, time or organizational boundaries.

Collaborative Command Centric Concept: Typical Staff Structure



Collaborative Command Centric Concept: Typical HQ Structure



Organizational Objectives

- Collaborative Working must contribute to:
  - Unity of action
  - Commitment of all to the pursuit of a common goal
  - Decentralization of decisions and actions
  - Trust between team members
  - Mutual understanding
  - Timeliness of decision making
  - Effectiveness and efficiency of the decision-making/action processes

Conclusions

- Operational environment has changed.
- Continental staff system does not lend itself to effective collaboration.
- Proposed staff structure based on operational functions.
- Command processes must emphasize collaborative working.

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Questions?

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